

MuSun Experiment: Measuring the Rate of Muon Capture on Deuteron

Tuesday 26 August 2014 11:00 (30 minutes)

The goal of the MuSun experiment at PSI is to measure the rate of muon capture on the deuteron with a precision of 1.5%. This rate will be used to fix the low-energy constant that describes the two-nucleon weak axial current in Chiral perturbation theory. It will therefore calibrate evaluations of solar proton-proton fusion and neutrino-deuteron scattering(SNO experiment). MuSun forms part of the systematic program to achieve a new level of precision in confronting the theories of weak interactions, QCD and few body physics. MuSun inherits some of the well developed techniques and apparatus from a successful measurement of the rate for muon capture on the proton, the MuCap experiment, also performed at PSI. As in MuCap, MuSun uses a TPC as an active target, but to optimize the molecular kinetics, its ultra-pure deuterium gas is kept at 30K. The status of the hardware and details of the data analysis for a high statistics run taken in 2013 will be presented.

WG3: Accelerator Physics (Yes/No)

No

WG2: Neutrino Scattering Physics (Yes/No)

No

WG4: Muon Physics (Yes/No)

Yes

WG1: Neutrino Oscillation Physics (Yes/No)

No

Type of presentation

Oral presentation

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Session Classification: WG4: Muon Physics and High Intensity applications